

## FEASIBILITY STUDY

City of Gastonia and Town of Cramerton

Widening of SR 2478 (Titman Road) and  
SR 2209 (Cramerton Road/Market Street)  
from NC 279 (New Hope Road) to US 29-74 (Wilkinson Boulevard)

Gaston County

Division 12

FS-0112C



Prepared by the  
Program Development Branch  
N. C. Department of Transportation

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Date

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**I. General Description**

This feasibility study describes the proposed widening of SR 2478 (Titman Road) and SR 2209 (Cramerton Road/Market Street) from NC 279 (New Hope Road) to US 29-74 (Wilkinson Boulevard) with a portion on new location, a distance of approximately 2.6 miles. The project location is shown on Figure 1. As part of the study, two different cross-sections for the proposed widening of SR 2478 and SR 2209 were investigated, the details of which are as follows:

- ◆ Three-lane curb and gutter section on 120' right-of-way.
- ◆ Four-lane divided curb and gutter section on 120' right-of-way.

This is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including cost, and to identify potential problems that may require consideration in the planning and design phases.

**II. Background**

The purpose of this project is to improve the traffic safety and operations along SR 2478 (Titman Road) and SR 2209 (Cramerton Road/Market Street). The Town of Gastonia and Gaston County support this project.

SR 2478 (Titman Road) is designated as an urban collector in the North Carolina Statewide Functional Classification System and as a thoroughfare in the 2006 Gaston Urban Area Thoroughfare Plan. SR 2478 is a two-lane shoulder section with a pavement width of 18 feet from edge of pavement to edge of pavement. The development along SR 2478 is residential and commercial.

SR 2209 (Cramerton Road/Market Street) is designated as an urban minor arterial in the North Carolina Statewide Functional Classification System and as a thoroughfare in the 2006 Gaston Urban Area Thoroughfare Plan. SR 2209 varies from a two-lane shoulder section to a four-lane undivided curb and gutter section with pavement widths of

18 to 37 feet from edge of travelway to edge of travelway. The development along SR 2209 is residential and commercial.

There are two existing bridges within the project study area. Bridge No. 16 is a two-lane bridge, 38' wide and 145' long which crosses over the Norfolk Southern Railway. Bridge No. 16 was built in 1979 and has a sufficiency rating of 97.5 out of 100. Bridge No. 17 is a two-lane bridge, 30' wide and 117' long which crosses over Duhart's Creek. Bridge No. 17 was built in 1989 and has a sufficiency rating of 80 out of 100.

It is anticipated that this project will have railroad impacts, since there is an existing grade separation with the Norfolk Southern Railways 'Main' line. At this location there are two tracks that carry approximately 30 passenger and freight trains per day at speeds ranging from 50 to 79 miles per hour.

### **III. Traffic and Safety**

There are five existing traffic signals within the project limits which may need to be modified to accommodate the proposed improvements. They are located at the following intersections:

- SR 2478 (Titman road) and NC 279 (New Hope Road)
- SR 2478 (Titman Road) and SR 2439 (Lowell-Bethesda Road)
- SR 2209 (Cramerton Road) and SR 2505 (Woodlawn Avenue)
- SR 2209 (Market Street) and SR 2490/SR 2491 (Eighth Avenue)
- SR 2209 (Market Street) and US 29-74 (Wilkinson Boulevard)

The current year Average Daily Traffic (ADT) along SR 2478 (Titman Road) is 6,300 vehicles per day (vpd). For the 2035 design year, the traffic volume along SR 2478 is estimated to be 14,000 vpd. Truck traffic along SR 2478 is estimated to make up approximately 4 percent of the daily traffic.

The current year ADT along SR 2209 (Cramerton Road/Market Street) ranges from 7,300 to 10,800 vpd. For the 2035 design year, the traffic volume along SR 2209 is estimated to range from 14,700 to 22,000 vpd. Truck traffic along SR 2209 is estimated to make up approximately 4 percent of the daily traffic.

For the proposed project, the estimated current year ADT ranges from 6,200 to 11,300 vpd. For the 2035 design year, the traffic volume along the proposed project is estimated to range from 14,000 to 23,100 vpd. Truck traffic along the proposed project is estimated to make up approximately 4 percent of the daily traffic.

SR 2478 (Titman Road) and SR 2209 (Cramerton Road/Market Street) operate at a level of service (LOS) E under current traffic volumes. With the recommended improvements, SR 2478 is projected to operate at a LOS D or better in the 2035 design year. All of the intersections along SR 2209 with the exception of the intersection of SR 2209 and US 29-74 operate at a LOS D or better. To improve the operations of the

intersection of SR 2209 and US 29-74 additional lanes or an interchange may be required, which is beyond the scope of this feasibility study.

Between 2003 and 2005, 30 crashes were reported along SR 2478 (Titman Road). The crash rate for SR 2478 is 512.01 crashes per 100 million vehicle miles (crashes/100MVM) traveled. This rate is higher than the statewide rate of 407.28 crashes/100MVM for two-lane undivided urban secondary routes. There were 11 injury crashes, 19 property damage only crashes, and no fatal crashes. The most prevalent types of crashes were Left Turn (27%), Angle (17%), Rear End (17%), Ran Off Road (13%), and Movable Object (10%). With the proposed widening, the likelihood of these types of crashes should be significantly reduced.

Between 2003 and 2005, 35 crashes were reported along SR 2209 (Cramerton Road/Market Street). The crash rate for SR 2209 is 407.12 crashes/100MVM traveled. This rate is slightly lower than the statewide rate of 407.28 crashes/100MVM for two-lane urban secondary routes. There were 15 injury crashes, 20 property damage only crashes, and no fatal crashes. The most prevalent types of crashes were Rear End (37%), Left Turn (26%), and Angle (23%). There was also one crash that involved a pedestrian. With the proposed widening of SR 2209, these types of crashes are expected to decrease.

#### **IV. Description of Alternatives**

It is proposed to widen SR 2478 (Titman Road) and SR 2209 (Cramerton Road/Market Street) from NC 279 (New Hope Road) to US 29-74 (Wilkinson Boulevard) with a portion on new location, a distance of approximately 2.6 miles.

**ALTERNATIVE 1:** This alternative along the project study area is from NC 279 (New Hope Road) to SR 2490/SR 2491 (Eighth Avenue) utilizing the existing SR 2478 (Titman Road) and SR 2209 (Cramerton Road/Market Street) with a portion on new location, a distance of approximately 2.6 miles. Included in the costs below are the replacement of the existing bridge (Bridge No. 17) over Duhart's Creek and the widening of the existing bridge (Bridge No. 16) over the Norfolk Southern Railroad.

**Cross-section:** Three-lane curb and gutter section, 40' from face to face of curb, with 12' lanes, 15' berms, and 5' sidewalks on 120' right-of-way to allow for expansion to a four-lane divided section at a later date.

With this proposed option, it is anticipated that there will be thirty-four (34) residences and eleven (11) businesses relocated due to this project. The total cost of this alternative, including construction and right-of-way, is estimated to be \$31,400,000.

The estimated construction cost for sidewalks on both sides of the roadway is \$700,000. This cost is included in the estimated construction cost below.

Right-of-way.....	\$15,000,000
Construction.....	\$16,400,000
Total Cost (Alternative 1).....	\$31,400,000

In addition to the widening of SR 2478 and SR 2209, the following roadway alignments are included in the costs shown above:

- The realignment of SR 3030 (Regal Oaks Road). The new cross-section will be a two-lane shoulder section with 12' lanes and 8' shoulders (4' of which are paved) on 100' right-of-way for approximately 180'.
- The realignment of SR 2209 (Cramerton Road). The new cross-section will be a two-lane shoulder section with 12' lanes and 8' shoulders (4' of which are paved) on 100' right-of-way for approximately 370'.
- The realignment of the SR 2490/SR 2491 (Eighth Avenue). The new cross-section will be a two-lane shoulder section with 12' lanes and 8' shoulders (4' of which are paved) on 100' right-of-way for approximately 100'.

The following intersection improvements are recommended and included in the costs shown above:

- SR 2478 (Titman Road) and NC 279 (New Hope Road):
  - addition of a westbound right turn lane on SR 2478
- SR 2478 (Titman Road) and SR 2439 (Lowell-Bethesda Road):
  - addition of northbound left and right turn lanes on SR 2439
  - addition of southbound left and right turn lanes on SR 2439
  - addition of an eastbound right turn lane on SR 2478
  - addition of a westbound right turn lane on the new connector
- SR 2209 (Market Street) and SR 2490/SR 2491 (Eighth Avenue):
  - addition of a eastbound right turn lane on SR 2209

This alternative could be reduced by \$6,200,000 if a minimum 100' right-of-way was implemented. However, the 100' right-of-way would not be able to accommodate the ultimate four-lane divided section.

**ALTERNATIVE 2:** This alternative along the proposed study area is from NC 279 (New Hope Road) to US 29-74 (Wilkinson Boulevard) utilizing the existing SR 2478 (Titman Road) and SR 2209 (Cramerton Road/Market Street) with a portion on new location, a distance of approximately 2.6 miles. Included in the costs below are the replacement of the existing bridge (Bridge No. 17) over Duhart's Creek and the widening of the existing bridge (Bridge No. 16) over the Norfolk Southern Railroad.

**Cross-section:** Four-lane divided curb and gutter section, 75' from face to face of curb, with 12' lanes, a 23' raised grass median, 15' berms, and 5' sidewalks on 120' right-of-way.

With this proposed option, it is anticipated that there will be thirty-four (34) residences and eleven (11) businesses relocated due to this project. The total cost of this alternative, including construction and right-of-way, is estimated to be \$39,400,000.

The estimated construction cost for sidewalks on both sides of the roadway is \$800,000. This cost is included in the estimated construction cost below.

Right-of-way.....	\$15,000,000
Construction.....	\$24,400,000
Total Cost (Alternative 2).....	\$39,400,000

In addition to the multi-lane widening of SR 2478 and SR 2209, the following roadway realignments are included in the costs shown above:

- The extension of SR 3032 (Hearthstead Lane) to provide access to the project. The cross-section will be a two-lane shoulder section with 12' lanes and 8' shoulders (4' of which are paved) on 100' right-of-way for approximately 0.2 miles.
- The realignment of SR 2209 (Cramerton Road). The new cross-section will be a two-lane shoulder section with 12' lanes and 8' shoulders (4' of which are paved) on 100' right-of-way for approximately 370'.
- The realignment of the SR 2490/SR 2491 (Eighth Avenue). The new cross-section will be a two-lane shoulder section with 12' lanes and 8' shoulders (4' of which are paved) on 100' right-of-way for approximately 100'.

The following intersection improvements are recommended and included in the costs shown above:

- SR 2478 (Titman Road)/SR 1255 (Hudson Boulevard) and NC 279:
  - addition of northbound dual left turn lanes and a single right turn lane on NC 279
  - addition of an eastbound right lane on SR 1255
  - addition of a westbound right turn lane on SR 2478
- SR 2478 (Titman Road) and SR 2439 (Lowell-Bethesda Road):
  - addition of northbound left and right turn lanes on SR 2439
  - addition of southbound left and right turn lanes on SR 2439
  - addition of a southbound through lane on SR 2439 for 100'
  - addition of a eastbound left turn lane on SR 2478
  - addition of westbound dual left turn lanes on the new connector
- SR 2209 (Market Street)/Wesleyan Drive and US 29-74 (Wilkinson Boulevard):
  - addition of northbound dual left turn lanes and a single right turn lane on US 29-74
  - addition of a southbound right turn lane on US 29-74
  - addition of a single eastbound left turn lane and dual right turn lanes on SR 2209
  - addition of a westbound left turn lane on SR 2209

## **V. Community Issues**

A detailed community impact investigation was not conducted for this feasibility study; however there is a cemetery and two churches within the project study area. No impacts to parks, recreation areas, or other community facilities are anticipated with this project.

Maps at the Survey and Planning Branch of the North Carolina State Historic Preservation Office were used to determine if any historic properties on the National Register of Historic Places (NRHP) or state study lists exist within the proposed project study area. No properties within the project study area were found to be a potential historic property.

## **VI. Natural Environment Issues**

The following is a preliminary review of environmental issues that might have a potential impact to the project. The information obtained for the environmental screening is from a Geographic Information System (GIS) database. The purpose of the environmental screening is to identify potential environmental issues early in the process.

### **Stream Classification**

The proposed project study area is located in the Catawba River Basin. SR 2209 (Cramerton Road) crosses Duhart's Creek, which has a stream classification of WS-V. This stream will likely need to be surveyed and have the appropriate coordination with the North Carolina Department of Environment and Natural Resources (NCDENR) and the U.S. Army Corps of Engineers (USACE) during any environmental document study.

### **Wetlands**

The proposed project study area contains wetlands associated with Duhart's Creek. Permitting with the U.S. Army Corps of Engineers (USACE) will likely need to be obtained before construction of the project, and appropriate mitigation measures should be taken if deemed necessary.

### **Floodplain**

The proposed project study area is within the 100 and 500-year floodplains. Construction will need to comply with all City of Gastonia and FEMA Flood Hazard Area and Floodway requirements.

### **Threatened and Endangered Species**

There were no threatened and endangered species identified within the project study area.

## VII. Recommendations

**ALTERNATIVE 1:** It was found that the three-lane curb and gutter section would not be able to accommodate design year 2035 traffic volumes. In the design year 2035, four intersections fail. Alternative 1 could be considered as an intermediate improvement if the 120' right-of-way is used in order to accommodate the widening to a four-lane divided section at a later date.

**ALTERNATIVE 2:** It was found that the four-lane divided curb and gutter section would be able to accommodate design year 2035 traffic volumes except for the intersection of SR 2209 (Market Street) and US 29-US 74 (Wilkinson Boulevard). ***Alternative 2 is the recommended alternative for the proposed widening of SR 2478 and SR 2209.***

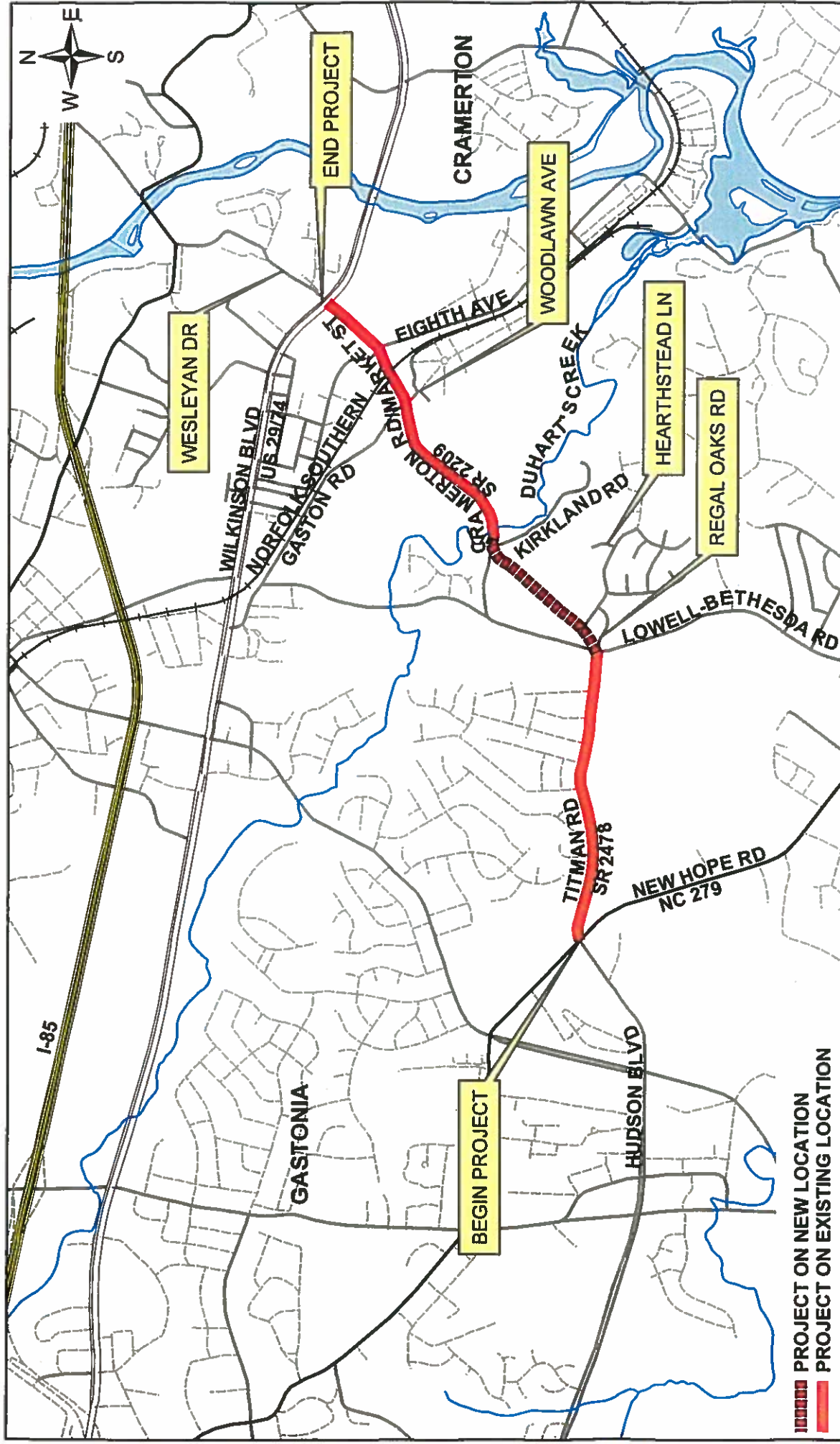
The total estimated cost for the recommended Alternative 2, a four-lane divided curb and gutter section, with 12' lanes, a 23' raised grass median, with 15' berms on 120' right-of-way, the replacement of Bridge No. 17, the widening of Bridge No. 16, the proposed roadway realignments, and the recommended intersection improvements is \$39,400,000.

## VIII. Additional Comments

It is anticipated that the proposed project will impact the Colonial Gas Line. The gas line has a 50' utility easement within the project area.

The benefit cost ratio for Alternative 2 is 4.42.





NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 PROGRAM DEVELOPMENT BRANCH

FS-0112C

SR 2478 (TITMAN RD.) & SR 2209 (CRAMERTON RD / MARKET ST.)  
 FROM NC 279 (NEW HOPE RD.) TO US 29-74 (WILKINSON BLVD.)

GASTON COUNTY

DIVISION 12

FIGURE 1